

Health Risk Behaviors among Missouri Middle and High School Students

Results from the 2019 Youth Risk Behavior Survey and
2017 Youth Tobacco Survey



Missouri Department of Health and Senior Services
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Introduction

The Missouri Department of Health and Senior Services, in collaboration with the Missouri Department of Elementary and Secondary Education and the U.S. Centers for Disease Control and Prevention (CDC), conducts biennial (every odd year) surveys of public middle and high school students to track progress in efforts to reduce health risk behaviors among youth. Information about the methodology for the Youth Risk Behavior Survey (YRBS) and Youth Tobacco Survey (YTS) may be found on page 24.

This report summarizes key findings from the 2019 YRBS and 2017 YTS including results from previous years that demonstrate changes over time. Previous years of YRBS data may be found on the CDC website at <https://www.cdc.gov/healthyyouth/data/yrbs/index.htm>. Previous reports of Missouri YRBS and YTS data may be found at <http://www.health.mo.gov/data/index.php>.

2019 Key Findings

The good news, 2009-2019:

- ✓ The percentage of middle school students who went to physical education classes daily significantly increased from 33.4 percent in 2009 to 46.4 percent in 2017.
- ✓ The percentage of high school students who drank non-diet soda or pop one or more times per day during the past seven days declined significantly between 2009 and 2019 from 31.5 percent in 2009 to 21.6 percent in 2019.
- ✓ The percentage of students who have ever tried smoking cigarettes has significantly declined since 2009 among middle (22.1% in 2009 to 10.3% in 2017) and high school (46.5% in 2009 and 24.5% in 2019) students.
- ✓ The percentage of high school students who currently smoke cigarettes decreased significantly between 2009 and 2019 from 18.9 percent in 2009 to 6.5 percent in 2019.
- ✓ Current alcohol use among high school students decreased significantly between 2009 and 2019 from 39.3 percent in 2009 to 27.9 percent in 2019.
- ✓ The percentage of high school students who have participated in binge drinking in the last month decreased significantly from 25.3 percent in 2009 to 15.2 percent in 2019.
- ✓ In 2019, 68.2 percent of high school students participated in school activities.

Areas of concern:

- The percentage of high school students who were obese increased from 14.3 percent in 2009 to 18.4 percent in 2019.
- The percentage of high school students who played video or computer games or used a computer for things other than school work for three or more hours per day increased from 22.9 percent in 2009 and 42.5 percent in 2019.
- Electronic vapor product usage among high school students increased significantly between 2013 and 2019 from 12.4 percent having ever tried electronic vapor products in 2013 to 49.6 percent having ever tried them in 2019.
- In 2019, 51.4 percent of high school seniors reported using an electronic vapor product at least once.
- In 2017, 31.4 percent of middle school students reported experiencing bullying on school property.
- High school students at all grade levels reported taking prescription drugs without having a prescription from a medical provider. This increased with grade level.
- Among high school students that drove in the past 30 days, about one-half texted or e-mailed while driving (45.8%).
- Approximately 63.7 percent of high school students reported riding with someone in the past 30 days who was using their cell phone while driving.
- In 2019, a significantly higher percentage of high school females (14.6%) than males (5.3%) reported having ever been forced to have sexual intercourse that they did not want.
- Approximately 8.4 percent of high school students reported being physically injured at least one time in the last year by someone they were dating. This percentage was approximately the same for both males (8.0%) and females (8.3%).
- In 2019, 15.8 percent of high school students rode on one or more of the past 30 days with someone driving who had been drinking alcohol.
- In 2019, more than one-fourth (27.8%) of high school males carried a weapon on one or more of the past 30 days.
- In 2019, 32.7 percent of high school students reported feeling sad or hopeless almost every day for at least two weeks at some point during the past year.
- In 2019, 17.4 percent of high school students considered suicide, 13.6 percent made a plan to commit suicide, 8.3 percent attempted suicide, and 2.5 percent of these attempts resulted in injury, poisoning or overdose that had to be treated by a doctor or nurse in the 12 months prior to the survey.

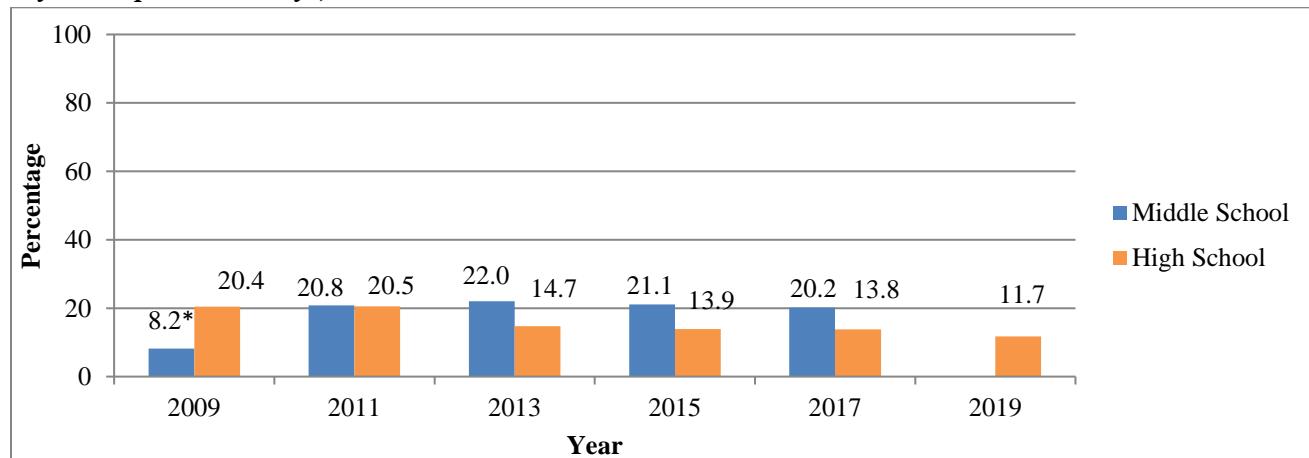
Health Risk Behaviors among Missouri Middle and High School Students

Dietary Behaviors

Fruit and vegetable consumption

The percentage of high school students who ate fruits and vegetables five or more times per day during the past seven days significantly decreased between 2009 and 2019 (Figure 1).

Figure 1: Percentage of middle and high school students who ate fruits and vegetables five or more times per day in the past seven days, 2009-2019

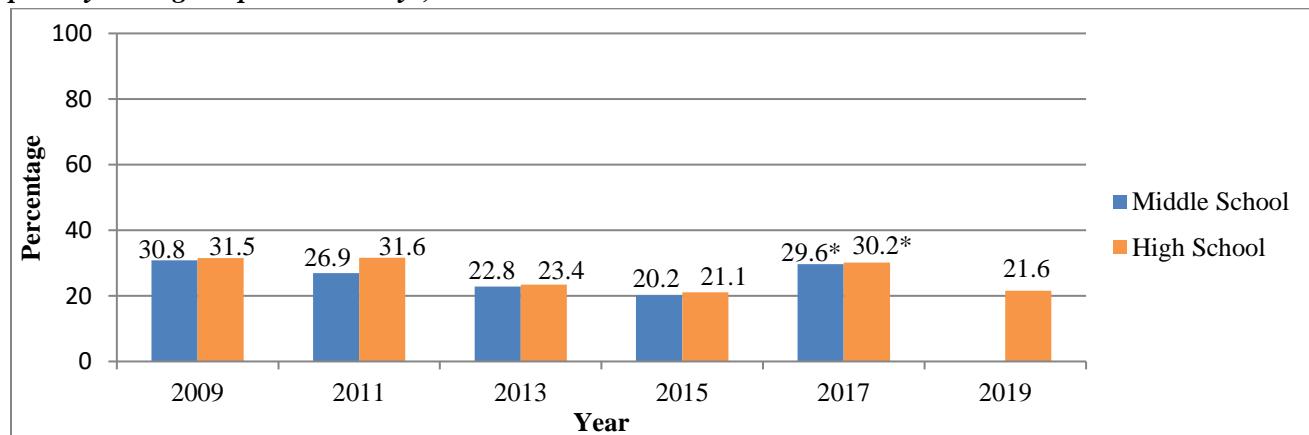


*Different question: Five or more servings of fruits and vegetable eaten the day before the survey.

Non-diet soda and sugar-sweetened beverage consumption

The percentage of middle and high school students who drank non-diet soda or pop one or more times per day during the past seven days did not change significantly between 2009 and 2019 (Figure 2).

Figure 2: Percentage of middle and high school students who drank non-diet soda or pop one or more times per day during the past seven days, 2009-2019

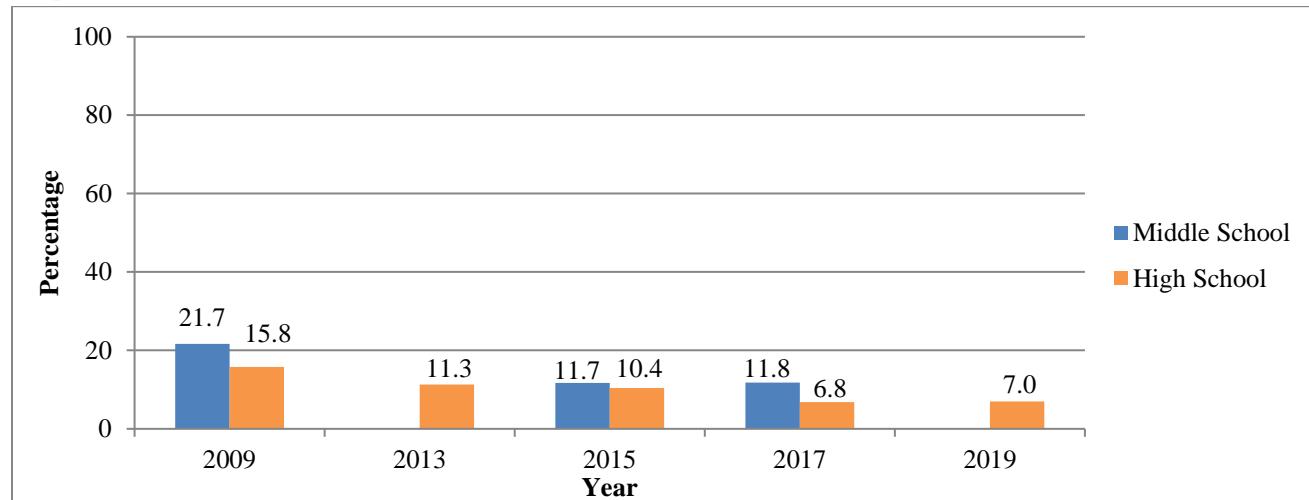


*Different question: Combination of two questions from the 2015 survey.

Milk consumption

The percentage of middle and high school students who drank three or more glasses of milk per day during the past seven days declined significantly from 2009 – 2019 (Figure 3). Data was not available for high school students in 2011 or for middle school students in 2013.

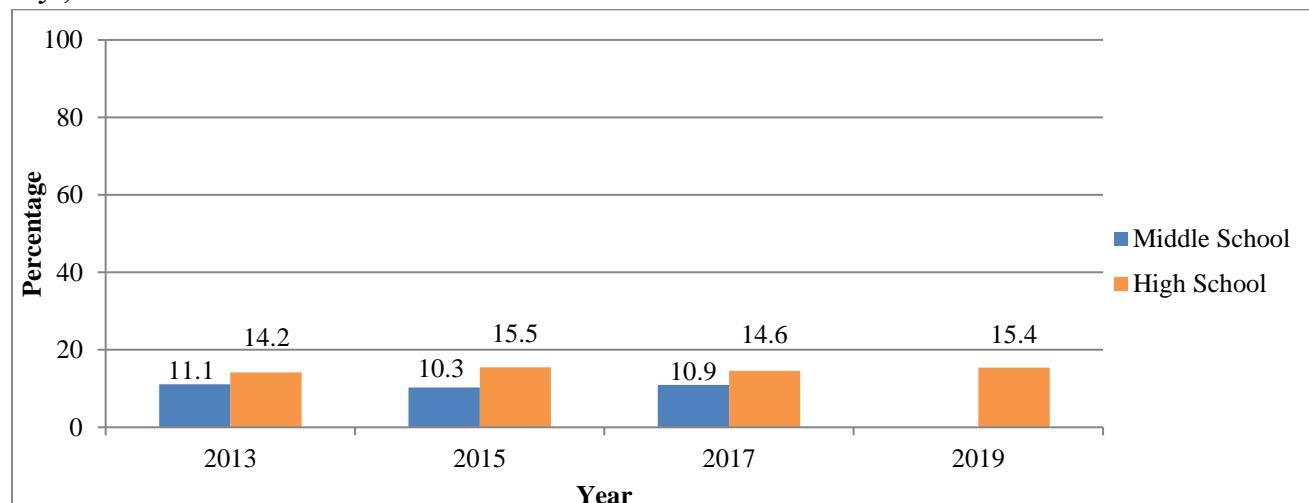
Figure 3: Percentage of middle and high school students who drank 3 or more glasses of milk per day during the past 7 days, 2009-2019



Breakfast consumption

In 2019, 15.4 percent of high school students did not eat breakfast on any of the past seven days. This is compared to 10.9 percent of middle school students reporting not having eaten breakfast on any of the past 7 days in 2017 (Figure 4).

Figure 4: Percentage of middle and high school students who did not eat breakfast on any of the past seven days, 2013-2019

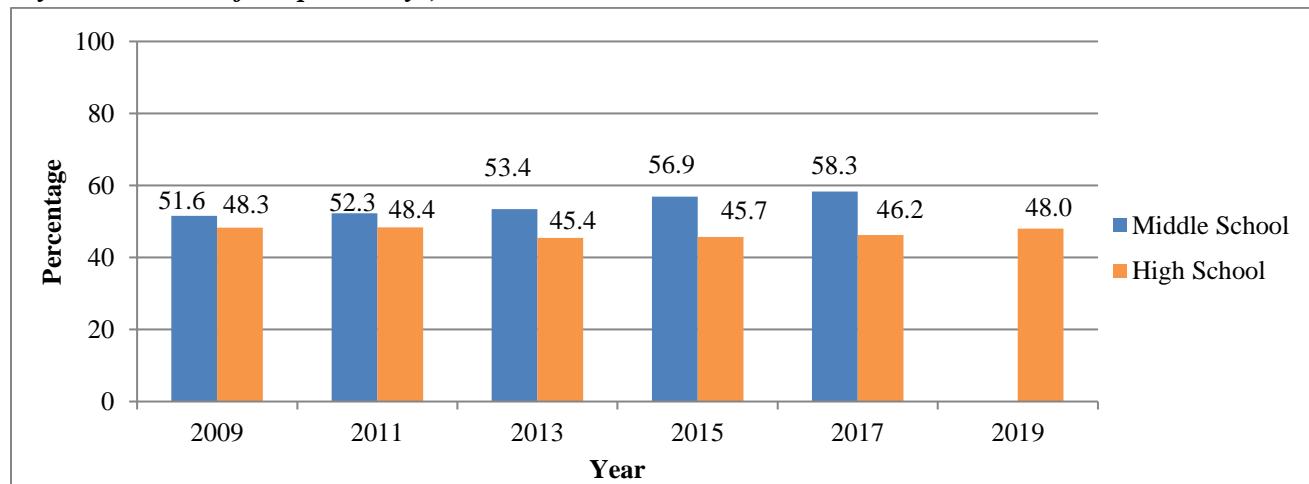


Physical Activity

Participation in physical activity

The percentage of high school students who participated in any type of physical activity that increased their heart rate and made them breathe hard some of the time for at least 60 minutes per day on five or more of the past seven days did not change significantly from 2009 to 2019 (Figure 5).

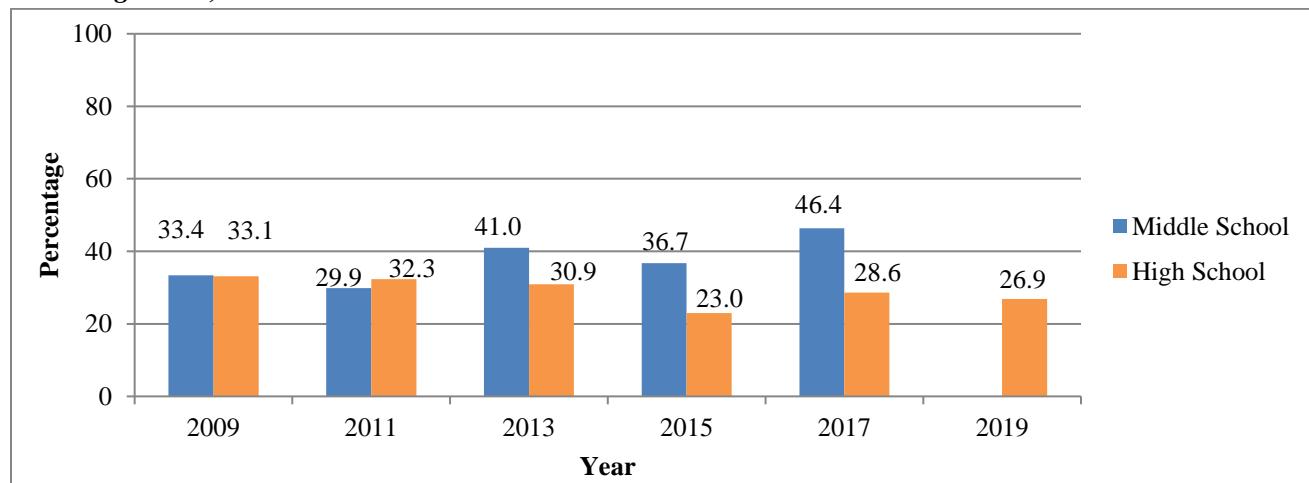
Figure 5: Percentage of middle and high school students who were physically active for at least 60 minutes per day on 5 or more of the past 7 days, 2009-2019



Participation in school physical education

Twenty-seven percent (26.9%) of high school students attended a daily physical education class during an average school week in 2019. The percentage of middle school students who attended daily physical education classes increased significantly from 33.4 percent in 2009 to 46.4 percent in 2017 (Figure 6).

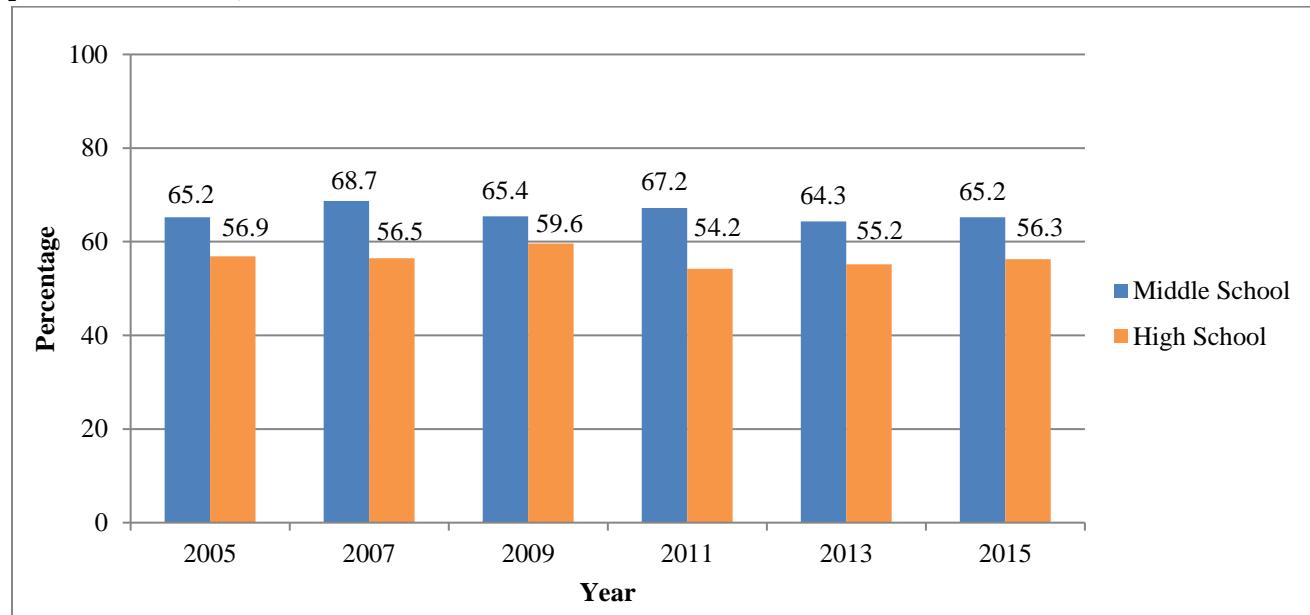
Figure 6: Percentage of middle and high school students who attended a daily physical education class during an average week, 2009-2019



Participation on sports teams

Data from each year between 2005 and 2015 shows that more than 60 percent of middle school students and 50 percent of high school students played on one or more sports teams during the past 12 months (Figure 7). Data was not available for 2017 and 2019.

Figure 7: Percentage of middle and high school students who played on one or more sports teams during the past twelve months, 2005-2015



Note: Data was not available for 2017 and 2019 as the question was not asked on the survey.

Television viewing and video game/computer usage on school days

Since 2009, a lower percentage of middle and high school students watched television on school days, while a higher percentage played video games or used a computer for activities other than school work. (Table 1). The percentage of students who watched television for three or more hours per day on an average school day decreased significantly from 32.4 percent in 2009 to 19.8 percent in 2019 among high school students, and from 33.2 percent in 2009 to 24.4 percent in 2017 among middle school students. The percentage of middle school students that played video games or used a computer for activities other than school work for three or more hours per day on a school day increased significantly from 25.9 percent in 2009 to 33.8 percent in 2017, and among high school students, it increased significantly from 22.9 percent in 2009 to 42.5 percent in 2019.

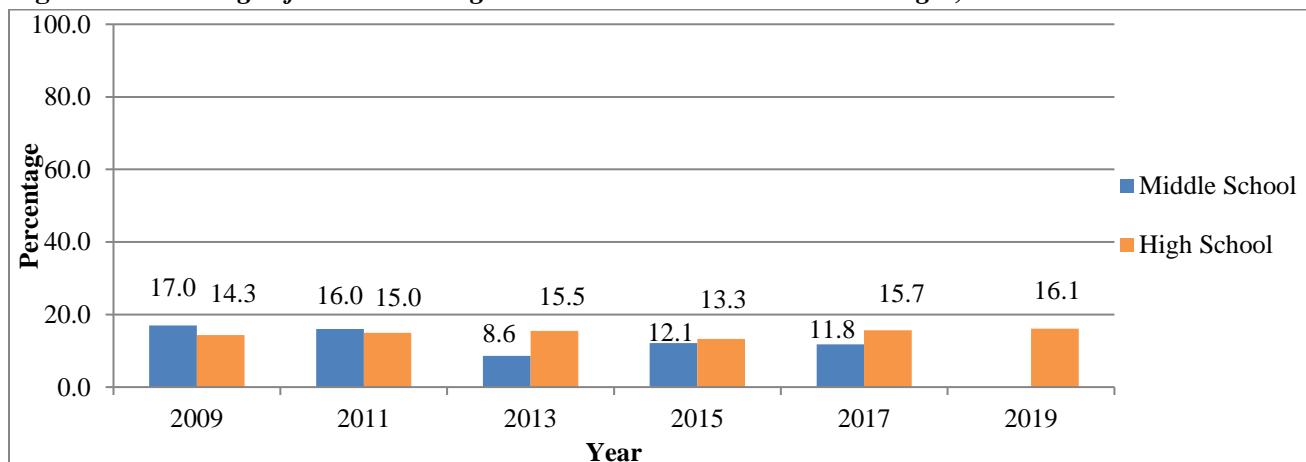
Table 1: Television viewing and video game / computer usage on school days, 2009-2019

Percentage of:	2009	2011	2013	2015	2017	2019
Middle school students that watched television three or more hours per day on an average school day	33.2	32.3	30.9	27.6	24.4	-
High school students that watched television three or more hours per day on an average school day	32.4	29.9	25.6	21.2	21.1	19.8
Middle school students that played video or computer games or used computer for other than school work for three or more hours per day on an average school day	25.9	27.1	29.8	31.8	33.8	-
High school students that played video or computer games or used computer for other than school work for three or more hours per day on an average school day	22.9	24.8	32.7	37.4	42.3	42.5

Overweight and Obesity

Overweight

Sixteen percent (16.1%) of high school students were classified as being overweight in 2019 (Figure 8). There was no significant trend observed in the percentage of overweight students between 2009 and 2019.

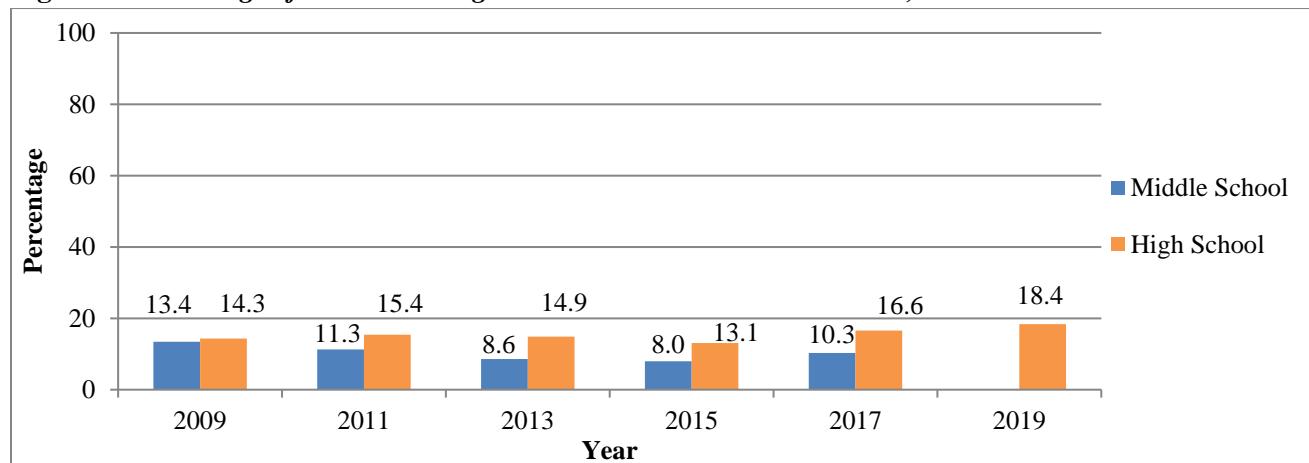
Figure 8: Percentage of middle and high school students who were overweight, 2009-2019

*Overweight for youth is defined as having a body mass index (BMI) between the 85th and 95th percentile on the CDC Growth Chart. BMI is calculated from self-reported height and weight.

Obesity

Eighteen percent (18.4%) of high school students were obese in 2019 (Figure 9). This is a significant increase from 14.3 percent in 2009.

Figure 9: Percentage of middle and high school students who were obese*, 2009-2019



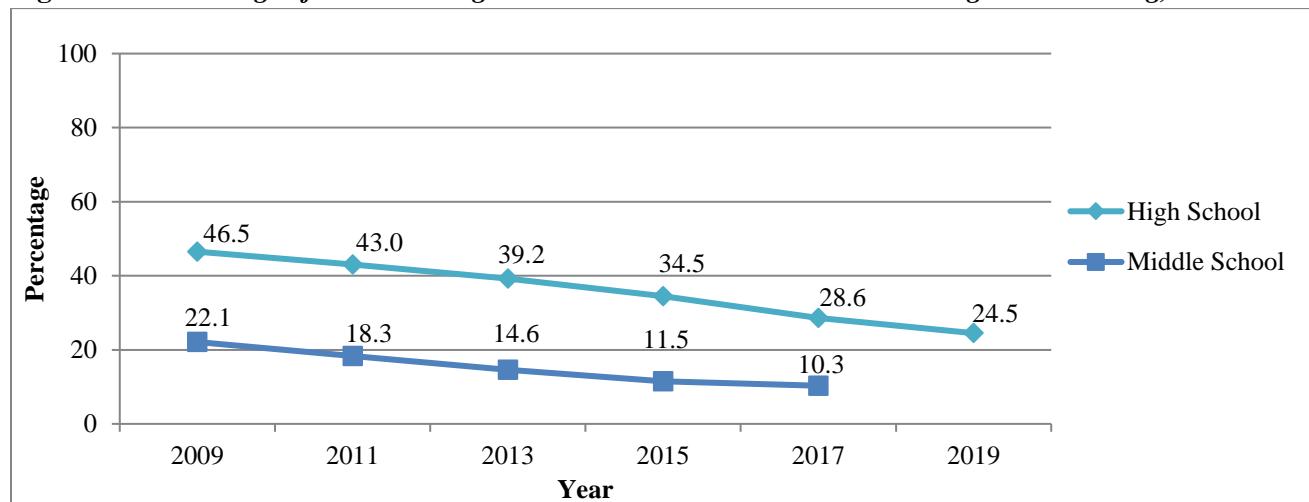
*Youth obesity is defined as having a BMI at or above the 95th percentile on the CDC Growth Chart.

Cigarette Smoking

Ever tried cigarette smoking

The percentage of middle and high school students who had ever tried smoking cigarettes declined significantly between 2009 and 2019 (Figure 10).

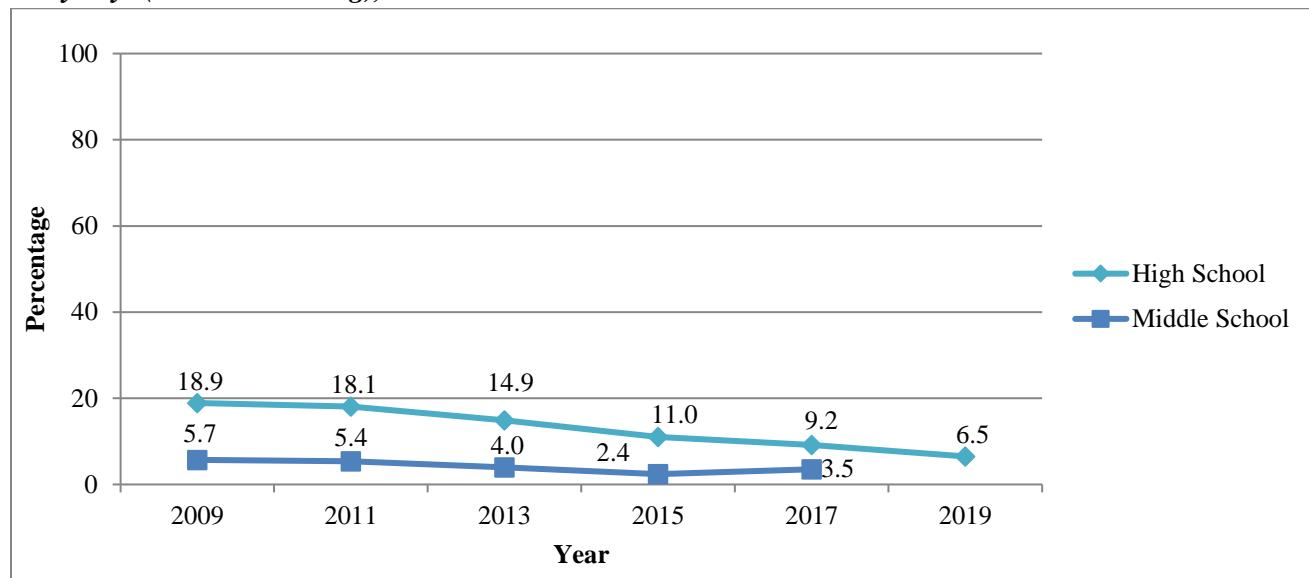
Figure 10: Percentage of middle and high school students who have ever tried cigarette smoking, 2009-2019



Current cigarette smoking

The percentage of middle and high school students who smoked cigarettes on one or more of the past 30 days declined significantly between 2009 and 2019 (Figure 11).

Figure 11: Percentage of middle and high school students who smoked cigarettes on one or more of the past thirty days (Current Smoking), 2009-2019

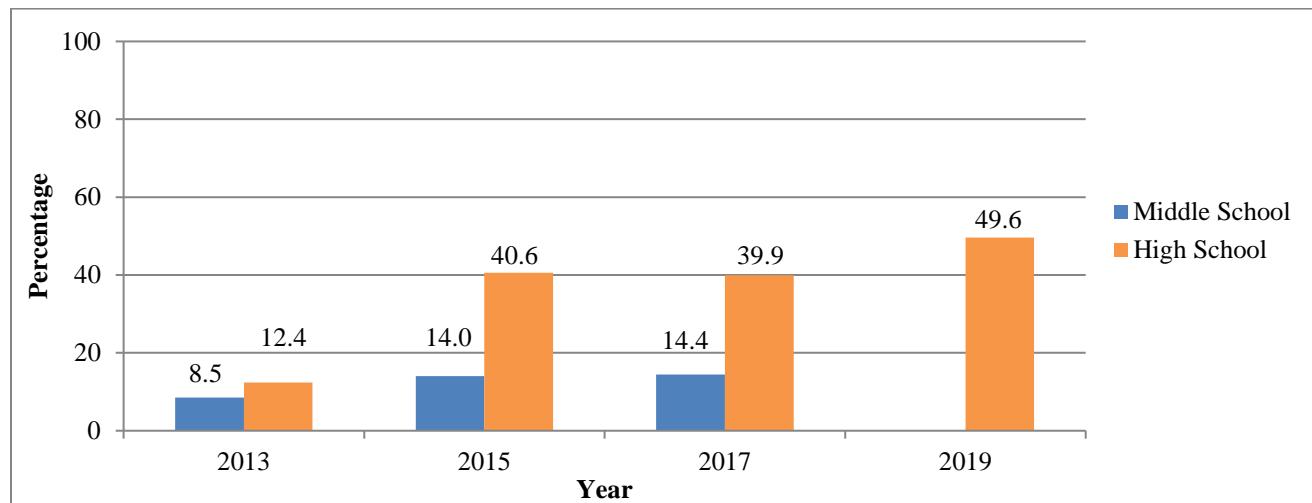


Electronic Vapor Products

Ever tried electronic vapor product

The percentage of high school students who had ever tried an electronic vapor product increased significantly between 2013 and 2019 from 12.4 percent in 2013 to 49.6 percent in 2019 (Figure 12). An increase was also identified among middle school students with 8.5 percent having ever tried an electronic cigarette in 2013 and 14.4 percent having ever tried one in 2017.

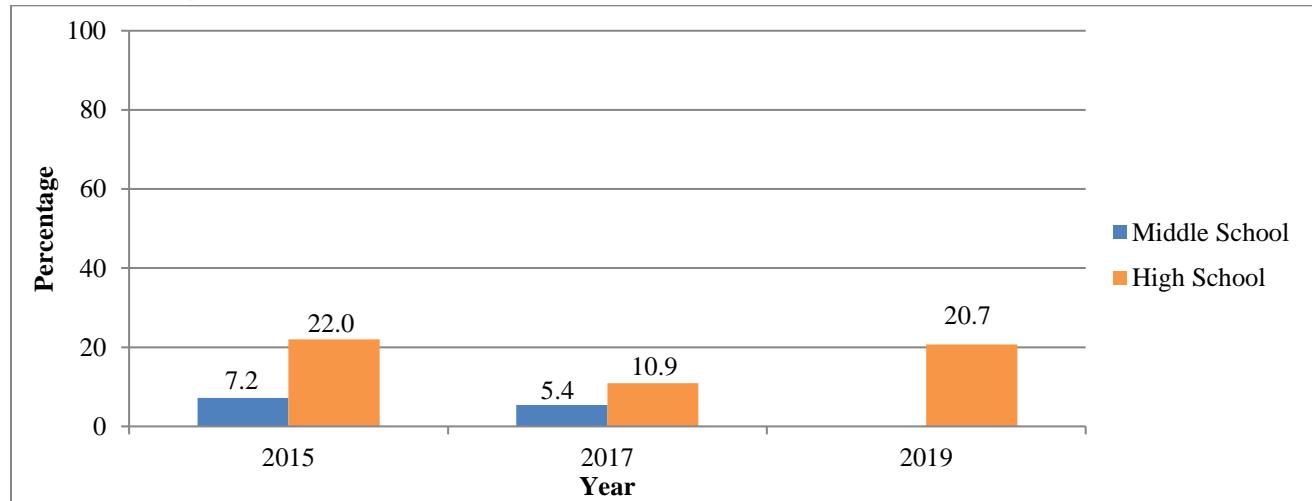
Figure 12: Percentage of middle and high school students who have ever used an electronic vapor product, 2013-2019



Currently use electronic vapor product

There was a significant increase from 2015 to 2019 in the percentage of high school students who used an electronic vapor product on one or more of the past 30 days (Figure 13).

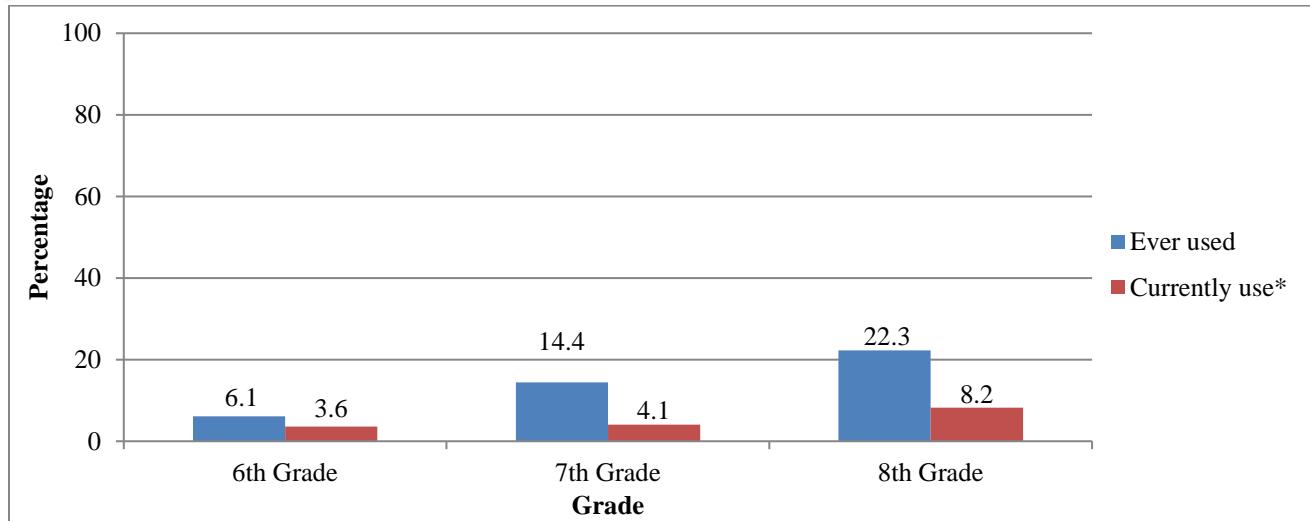
Figure 13: Percentage of middle and high school students who have used an electronic vapor product on one or more of the past thirty days (Current User), 2015-2019



Middle school electronic vapor use

Almost one-quarter (22.3%) of 8th grade students had ever used an electronic vapor product in 2017. This is compared to 14.4 percent of all 7th grade students and 6.1 percent of all 6th grade students (Figure 14).

Figure 14: Percentage of middle school students by grade who have used or who are using electronic vapor products, 2017

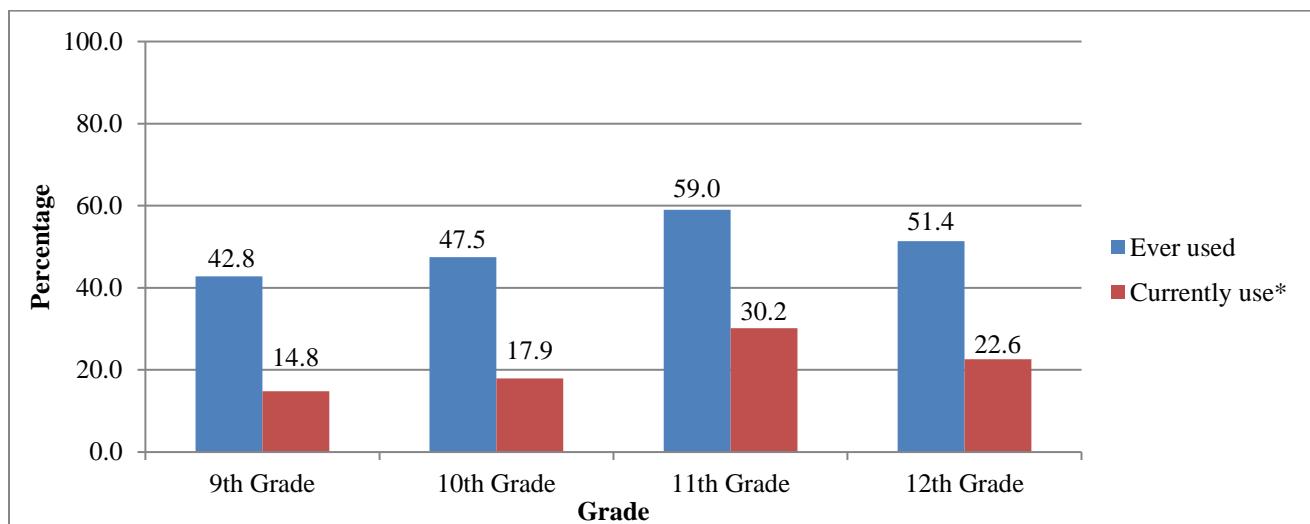


*Current use is defined as use of the product on one or more of the past 30 days.

High school electronic vapor use

Nearly 60 percent (59%) of 11th grade students had ever used an electronic vapor product in 2019 and over 30 percent currently used the products (Figure 15).

Figure 15: Percentage of high school students by grade who have used electronic vapor products, 2019

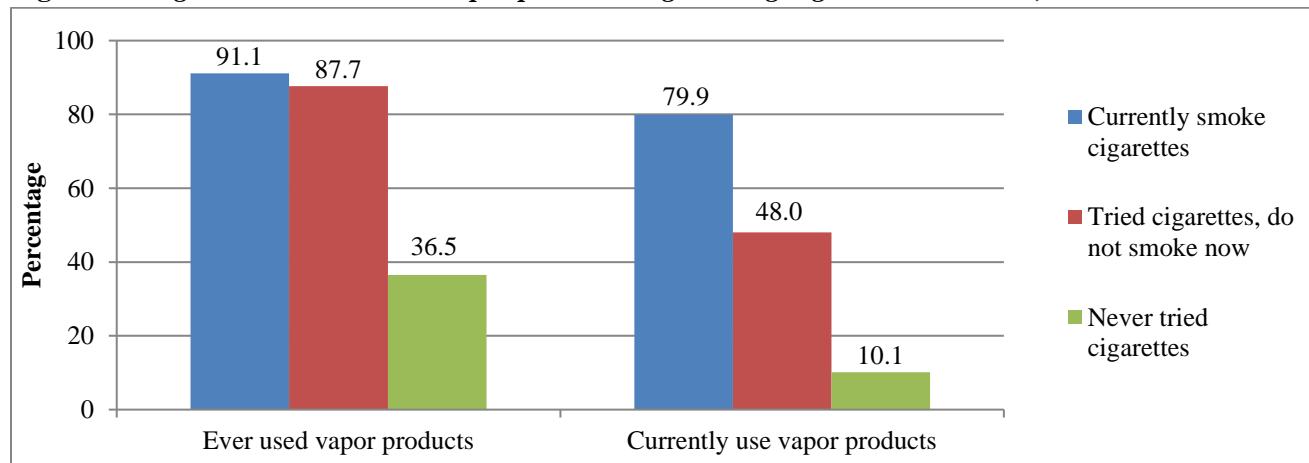


*Current use is defined as use of the product on one or more of the past 30 days.

Among current high school cigarette smokers in 2019, 91.1 percent had used a vapor product in the past and 79.9 percent currently used vapor products (Figure 16). Among students who had tried cigarettes but do not smoke now, 87.7 percent had used a vapor product in the past and 48.0 percent were current

vapor product users. Among students who had never tried smoking cigarettes, 36.5 percent had tried vapor products and 10.1 percent currently used the products.

Figure 16: Cigarette and electronic vapor product usage among high school students, 2019

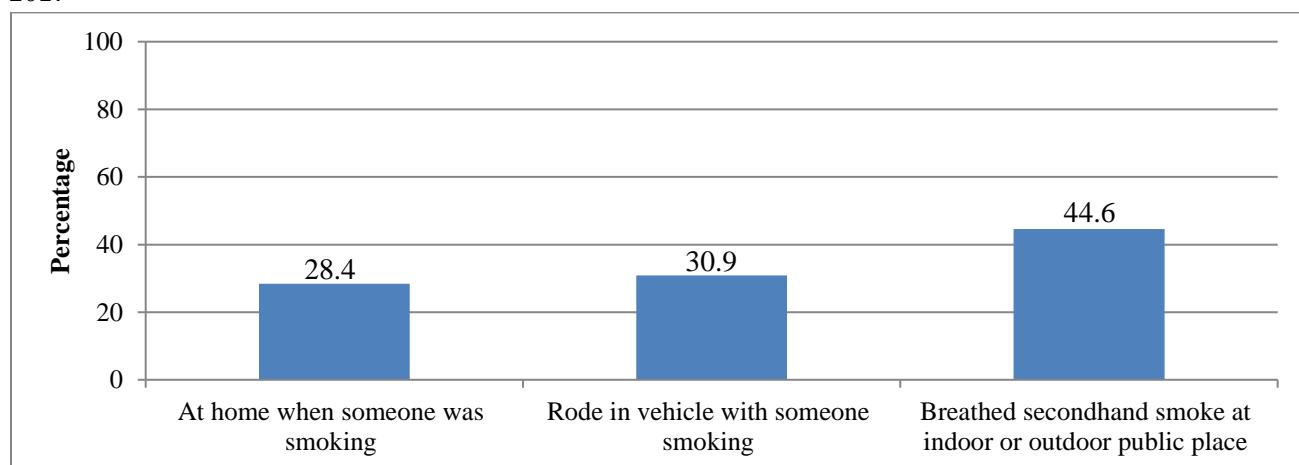


Exposure to Secondhand Tobacco Smoke

Middle School Students' Exposure

In 2017, almost one-half (44.6%) of middle school students were exposed to secondhand tobacco smoke while at an indoor or outdoor public place (such as school buildings, stores, restaurants, stadiums, school grounds, parking lots, stadiums and parks) during the past seven days. Almost one-third (30.9%) of middle school students rode in a vehicle with someone smoking, while 28.4 percent were exposed to secondhand smoke at home (Figure 17).

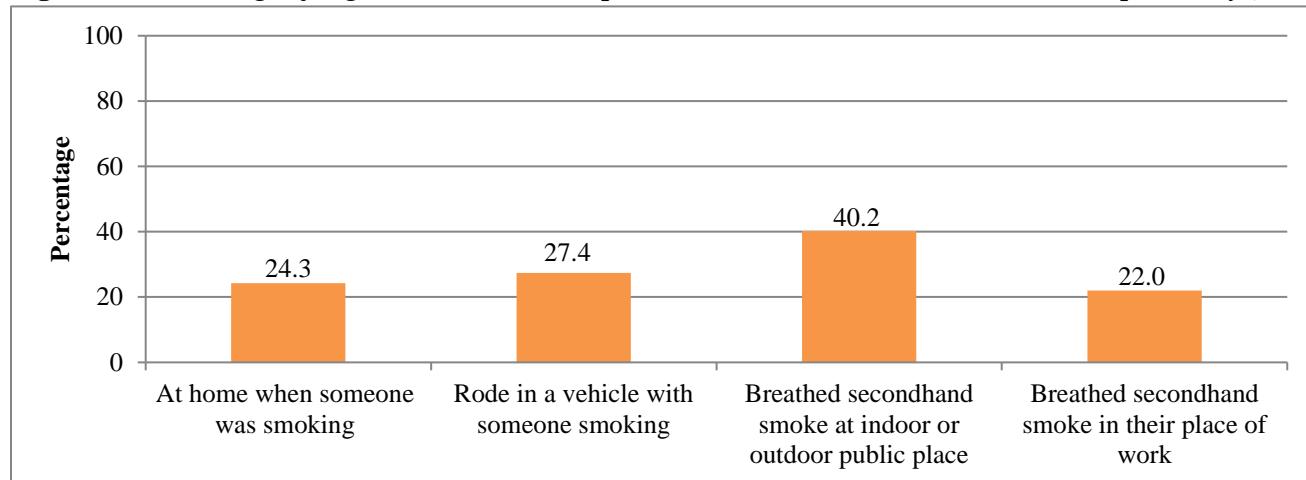
Figure 17: Percentage of middle school students exposed to secondhand tobacco smoke in the past seven days, 2017



High School Students' Exposure

In 2019, twenty-four percent (24.3%) of high school students reported being at home while someone was smoking. More than a quarter (27.4%) of high school students rode in a vehicle with someone who was smoking and about 40 percent (40.2%) breathed secondhand smoke at an indoor or outdoor public place in the past seven days (Figure 18). Twenty-two (22.0%) of working students reported secondhand smoke exposure in the workplace.

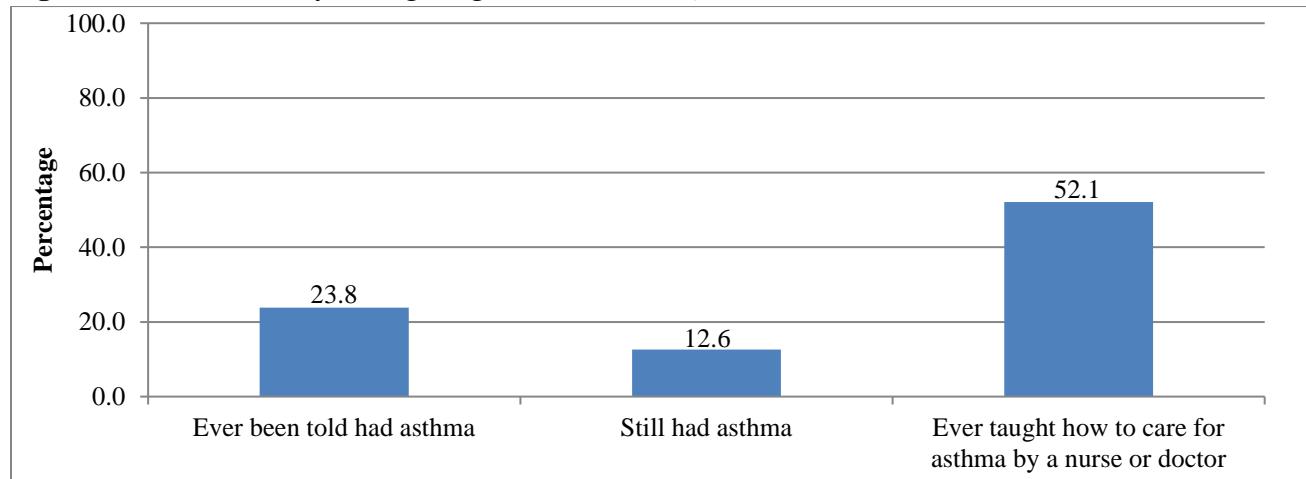
Figure 18: Percentage of high school students exposed to secondhand tobacco smoke in the past 7 days, 2019



Asthma

In 2019, 23.8 percent of high school students had been told by a doctor or nurse that they had asthma. Almost thirteen percent (12.6%) of high school students still had asthma at the time of the survey in 2019 (Figure 19). A little over 50 percent (52.1%) of high students who had ever been told they had asthma had been taught how to manage it by a doctor or nurse.

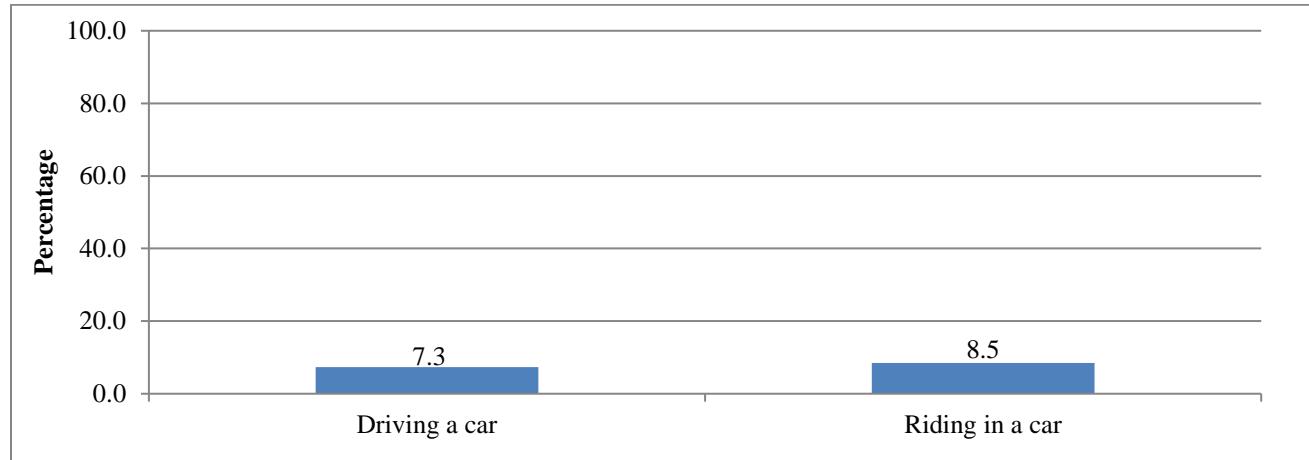
Figure 19: Asthma history amongst high school students, 2019



Seat Belt Use

In 2019, among high school students, 7.3% never or rarely wore a seat belt when driving a car. Approximately nine percent (8.9%) never or rarely wore a seat belt when riding in a car driven by someone else.

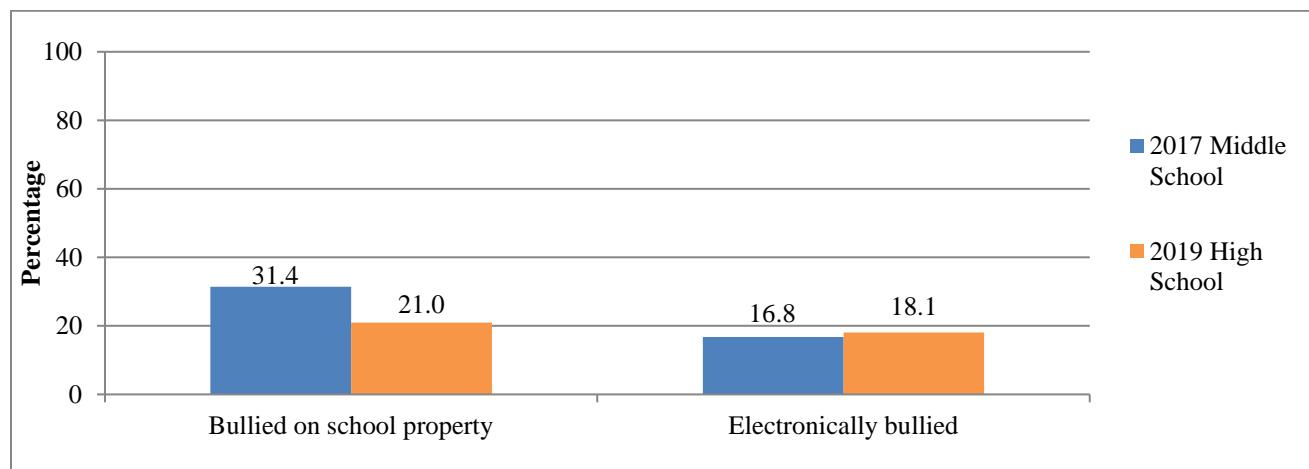
Figure 20: Percentage of high school students who never or rarely wore a seat belt, 2019



Bullying

In 2017, just over 31 percent (31.4%) of middle school students were bullied on school property during the past twelve months. Almost 17 percent (16.8%) of middle school students were electronically bullied through e-mail, chat rooms, instant messaging, websites, or texting in the past 12 months. In 2019, 21 percent of high school students were bullied on school property and just over 18 percent (18.1%) were electronically bullied in the past year (Figure 21).

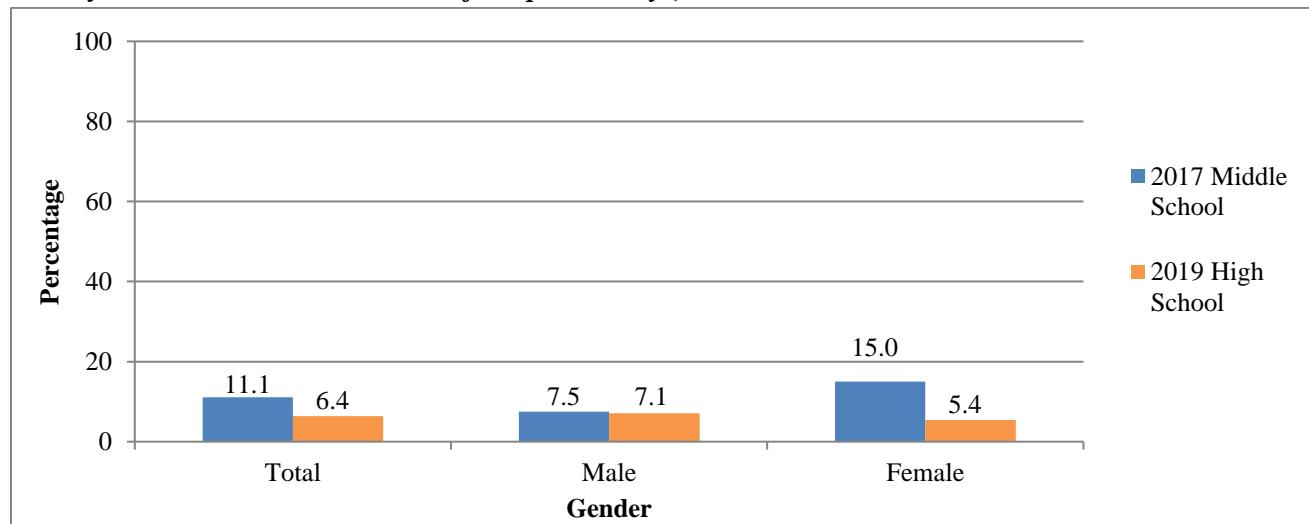
Figure 21: Percentage of middle and high school students who were bullied during the past twelve months, 2017 and 2019



Felt Unsafe Going to School

In 2019, a little more than six percent (6.4%) of high school students did not go to school on one or more of the past 30 days because they felt unsafe on the way to or from school or at school (Figure 22). The percentage of males (7.1%) was slightly higher than females (5.4%), but this difference was not statistically significant.

Figure 22: Percentage of high school students by gender who did not go to school because they felt unsafe on the way to or at school on 1 or more of the past 30 days, 2017 and 2019

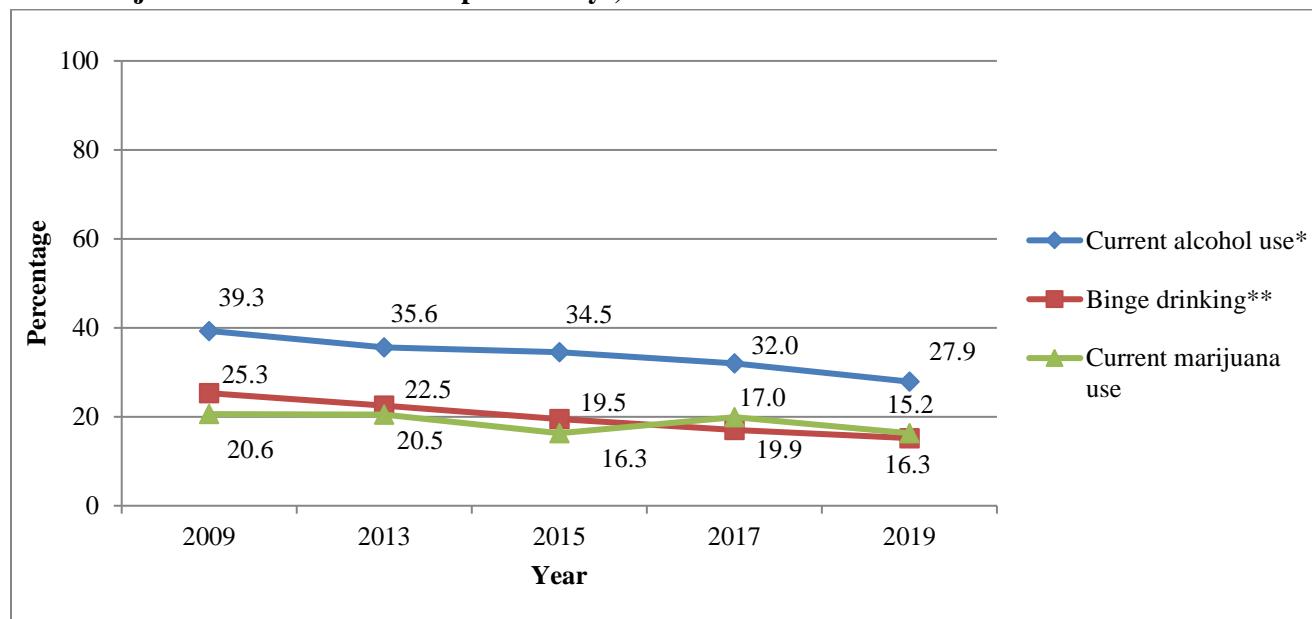


Health Risk Behaviors among Missouri High School Students

Alcohol and Marijuana Use

The percentage of high school students who had at least one drink of alcohol on one or more of the past thirty days declined significantly from 39.3 percent in 2009 to 27.9 percent in 2019. Binge drinking also declined significantly from 25.3 percent in 2009 to 15.2 percent in 2019. Lastly, marijuana use among high school students did not change significantly between 2009 and 2019 with 20.6 percent of students reporting use on one or more of the past 30 days in 2009 and 16.3 percent of students reporting use on one or more of the past 30 days in 2019 (Figure 23). Data was not available in 2011.

Figure 23: Percentage of high school students who have used alcohol, participated in binge drinking, or used marijuana on 1 or more of the past 30 days, 2009-2019



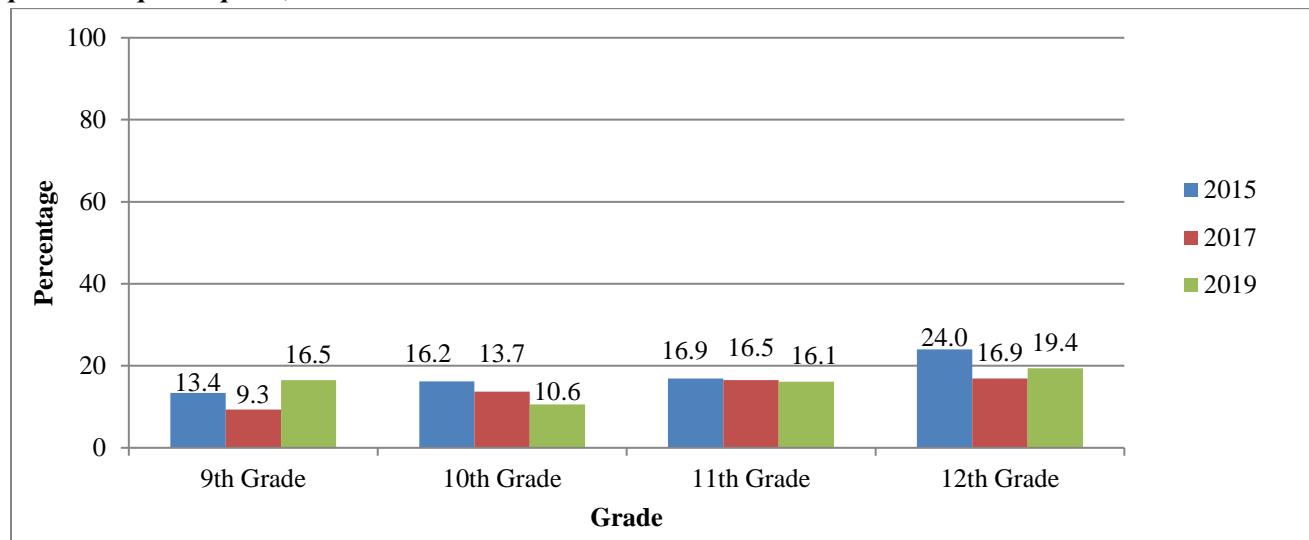
*Current alcohol use: Having one drink on one or more of the past 30 days

** Binge drinking: Having five or more drinks for males and four or more drinks for females

Prescription Drug Use

In 2019, the percentage of 9th and 12th grade students who had taken prescription drugs without a medical provider's prescription increased significantly.

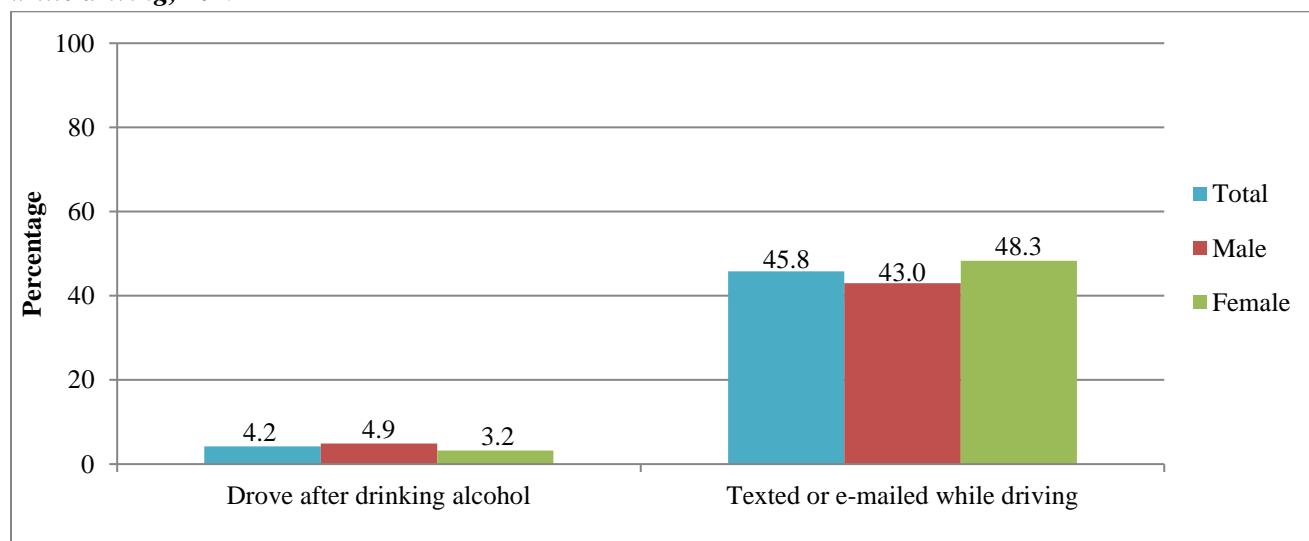
Figure 24: Percentage of high school students by grade who have taken prescription drugs without a medical provider's prescription, 2015-2019



Driving while Drinking, Texting or E-mailing on Cell Phone

In 2019, among students who drove a car or other vehicle during the past thirty days, 4.2 percent drove after drinking alcohol and 45.8 percent texted or e-mailed while driving (Figure 25).

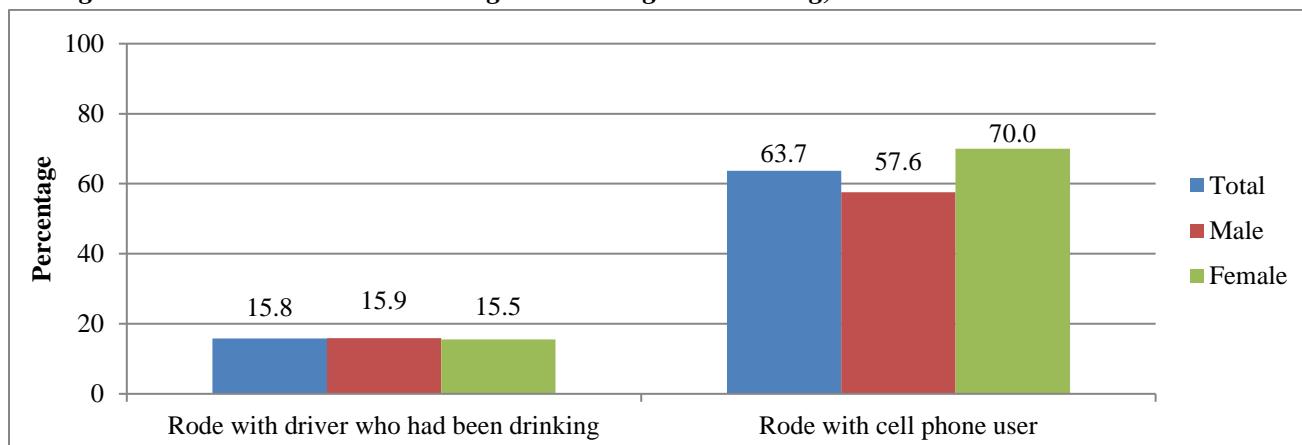
Figure 25: Percentage of high school students by gender who have driven after drinking or texted or e-mailed while driving, 2019



Rode with Someone who was Drinking or Using a Cell Phone while Driving

In 2019, 15.8 percent of high school students rode on one or more days of the past 30 days with a driver who had been drinking alcohol. A significantly higher percentage of females (63.7%) than males (57.6%) rode with someone who was using a cell phone while driving on one or more of the past 30 days (Figure 26).

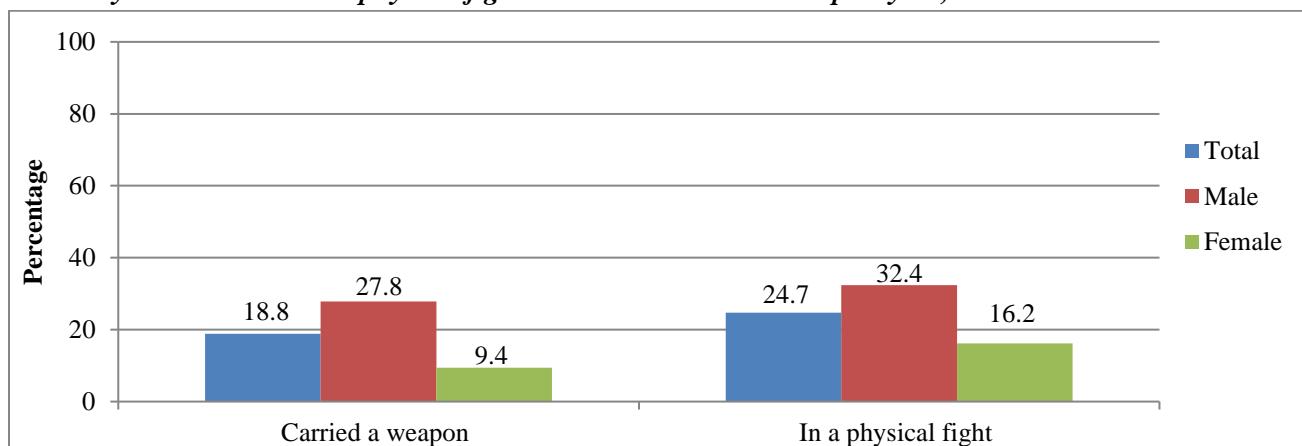
Figure 26: Percentage of high school students by gender who have ridden with someone who had been drinking or with someone who was texting or e-mailing while driving, 2019



Weapon Carrying and Physical Fighting

In 2019, a significantly greater proportion of high school males (27.8%) than females (9.4%) carried a weapon on one or more of the past 30 days (Figure 27). Similarly, a significantly higher percent of high school males (32.4%) than females (16.2%) were involved in a physical fight in the past 12 months (Figure 27).

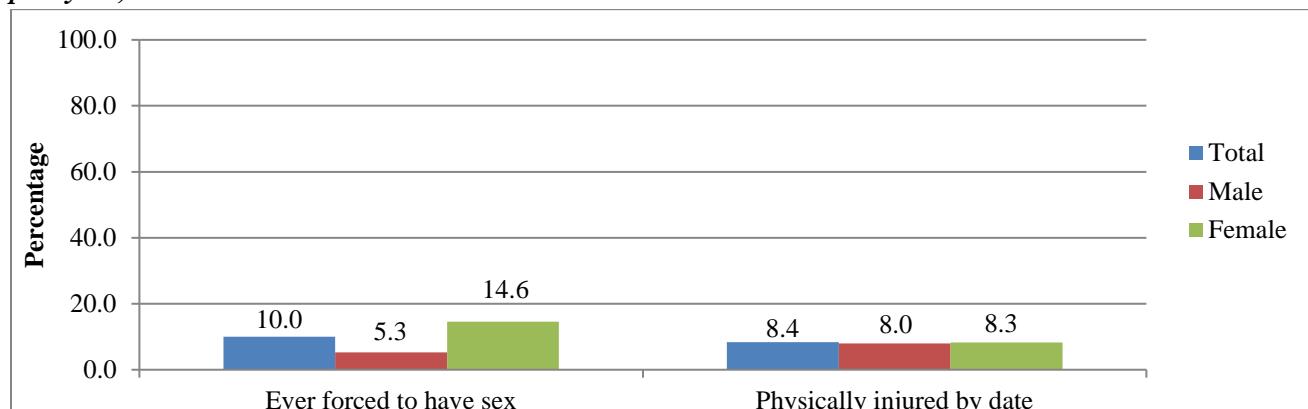
Figure 27: Percentage of high school students by gender who have carried a weapon on one or more of the past 30 days or have been in a physical fight one or more times in the past year, 2019



Forced Sexual Intercourse and Dating Violence

In 2019, a significantly higher percentage of high school females (14.6%) than males (5.3%) had ever been physically forced to have sexual intercourse that they did not want. Among students who dated or went out with someone in the past 12 months, 8.0 percent of males and 8.3 percent of females had been physically injured by someone they were dating (Figure 28).

Figure 28: Percentage of high school students by gender who have been physically forced to have unwanted sexual intercourse or who have been physically injured by someone they were dating one or more times in the past year, 2019

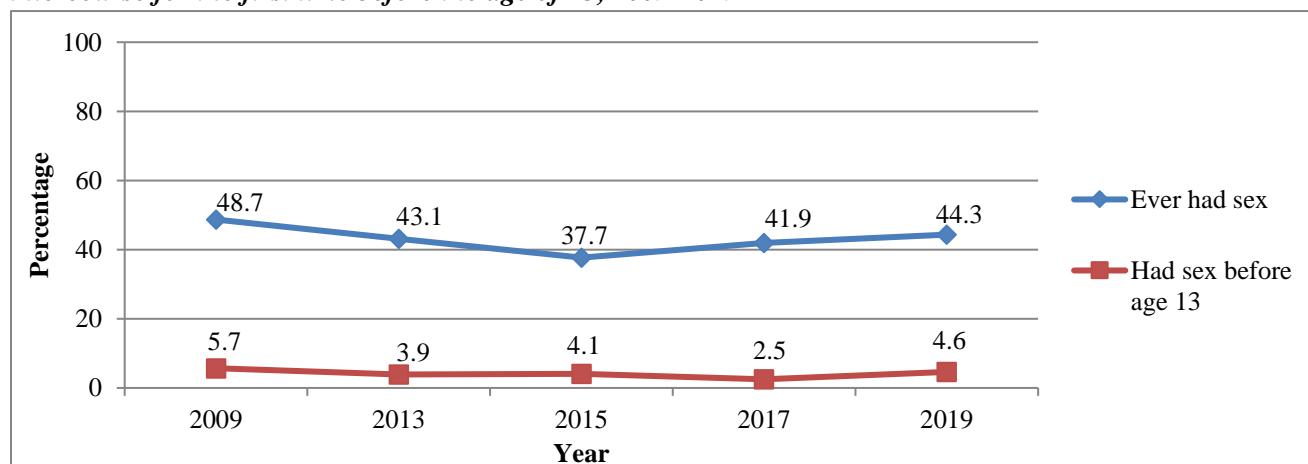


Sexual Intercourse

Ever had sexual intercourse and intercourse before age 13

The percentage of high school students who had ever had sexual intercourse did not change significantly from 2009 to 2019. Likewise, the percentage of high school students who had sexual intercourse before age 13 did not change significantly from 2009 – 2019 (Figure 29).

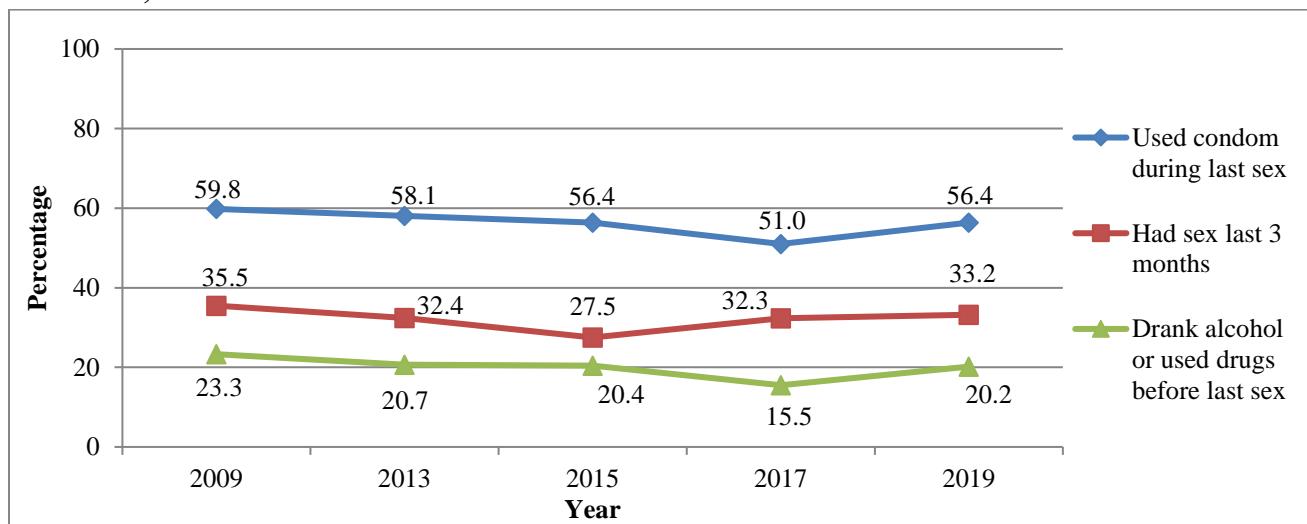
Figure 29: Percentage of high school students who have ever had sexual intercourse or who had sexual intercourse for the first time before the age of 13, 2009-2019



Current sexual intercourse, condom and alcohol use

The percentage of high school students who had sexual intercourse with one or more people during the past three months (current intercourse) declined significantly from 2009 to 2015, but did not change from 2017 – 2019. The percentage of high school students that used a condom during last sexual intercourse, or drank alcohol or used drugs before last sexual intercourse did not change significantly over the past decade (Figure 30).

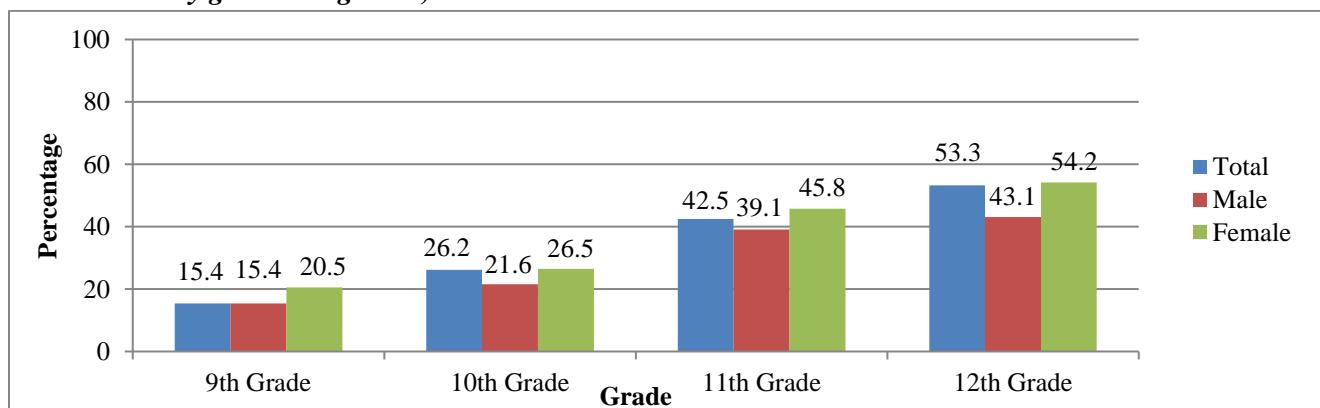
Figure 30: Percentage of high school students who used a condom during last sexual intercourse, had sexual intercourse with one or more people in the past three months, or drank alcohol or used drugs before last sexual intercourse, 2009-2019



Current sexual intercourse

Over 15 percent (15.4%) of 9th grade and more than half of 12th grade students (53.3%) had sexual intercourse with one or more people in the past three months. This indicates that the higher the grade level, the greater the prevalence of having sexual intercourse. The results indicate that females are consistently more likely to have had sexual intercourse over the past three months, regardless of grade (Figure 31).

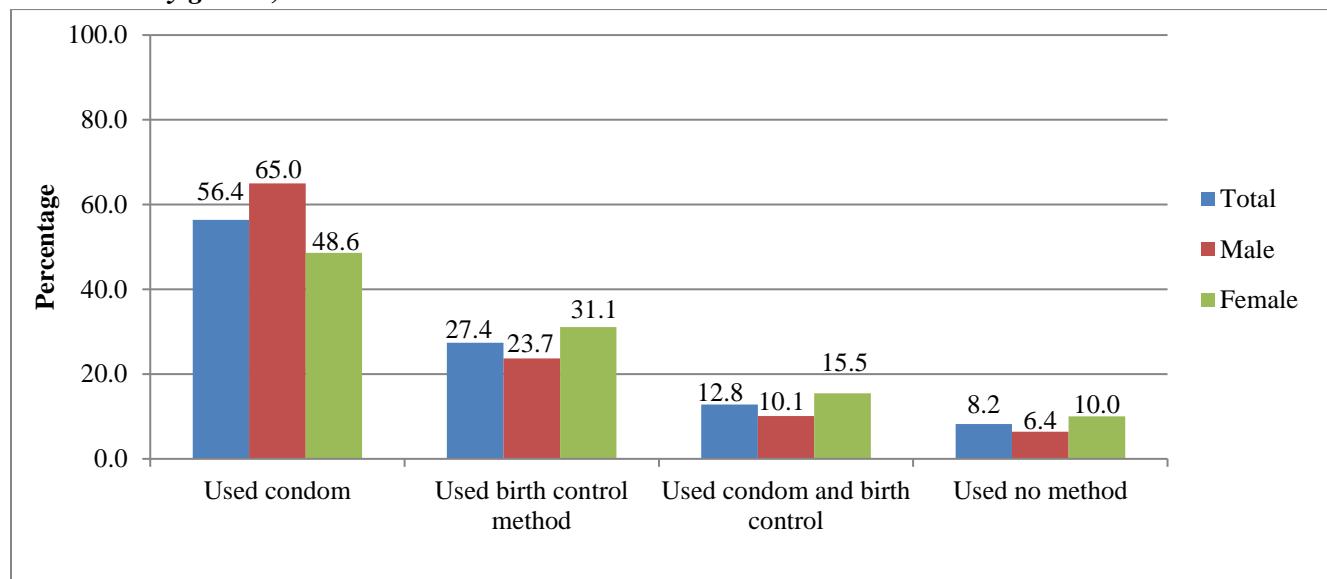
Figure 31: Percentage of high school students who had sexual intercourse with one or more people in the past three months by grade and gender, 2019



Condom and birth control use by students or their partner

In 2019, among high school students who had sexual intercourse in the past three months, over 50 percent (56.4%) used a condom during last sexual intercourse to prevent pregnancy and sexually transmitted diseases (STDs), 27 percent (27.4%) used birth control methods other than condoms (e.g. pills, IUD or implant, injection, patch or ring) to prevent pregnancy, and almost 13 percent (12.8%) used both a condom and a birth control method to prevent STDs and pregnancy. Lastly, over eight percent (8.2%) used no birth control method at all. (Figure 32).

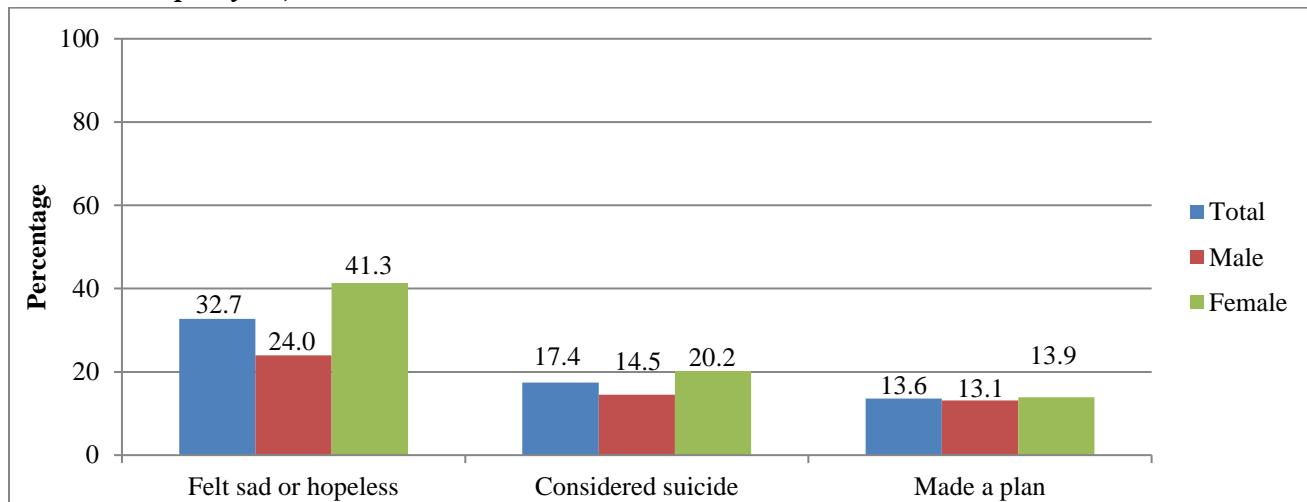
Figure 32: Percentage of high school students who used methods to prevent pregnancy and STDs during last intercourse by gender, 2019



Depression and Suicide

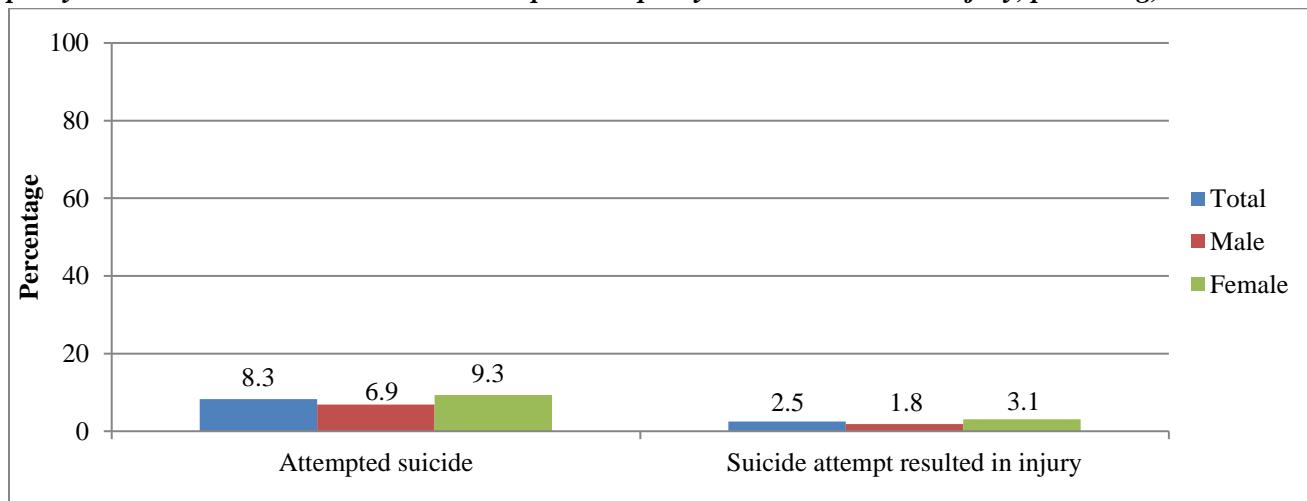
In 2019, more than 40 percent (41.3%) of females felt so sad or hopeless almost every day at least two consecutive weeks during the past 12 months that they stopped doing some usual of their activities. This is significantly greater than males (24.0%). About one fifth (20.2%) of females seriously considered suicide and 13.6 percent made a suicide plan (Figure 33).

Figure 33: Percentage of high school students by gender who have felt sad or hopeless almost every day for two weeks in the past year, seriously considered suicide in the past year, or made a plan about how they would attempt suicide in the past year, 2019



In 2019, over eight percent (8.3%) of high school students attempted suicide and about three percent (2.5%) of students who attempted suicide had to be treated by a doctor for an injury, poisoning or an overdose (Figure 34). There were no statistically significant differences between males and females.

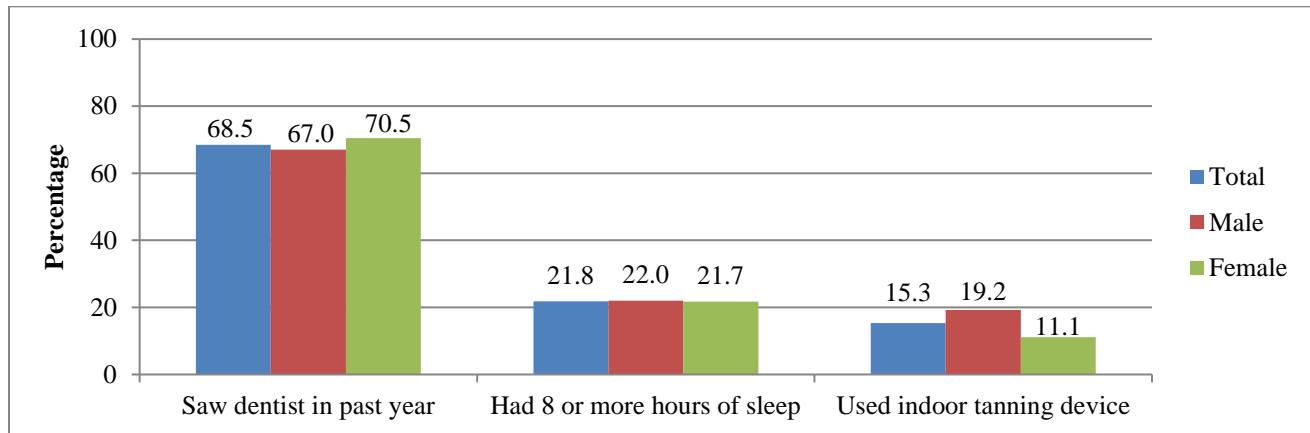
Figure 34: Percentage of high school students by gender who have attempted suicide 1 or more times in the past year or who have made a suicide attempt in the past year that resulted in injury, poisoning, or overdose



General Health Issues

In 2019, 68.5 percent of high school students had visited a dentist in the past 12 months, 1.8 percent had received eight or more hours of sleep on an average school night, and 15.3 percent had used an indoor tanning device one or more times in the past 12 months (Figure 35).

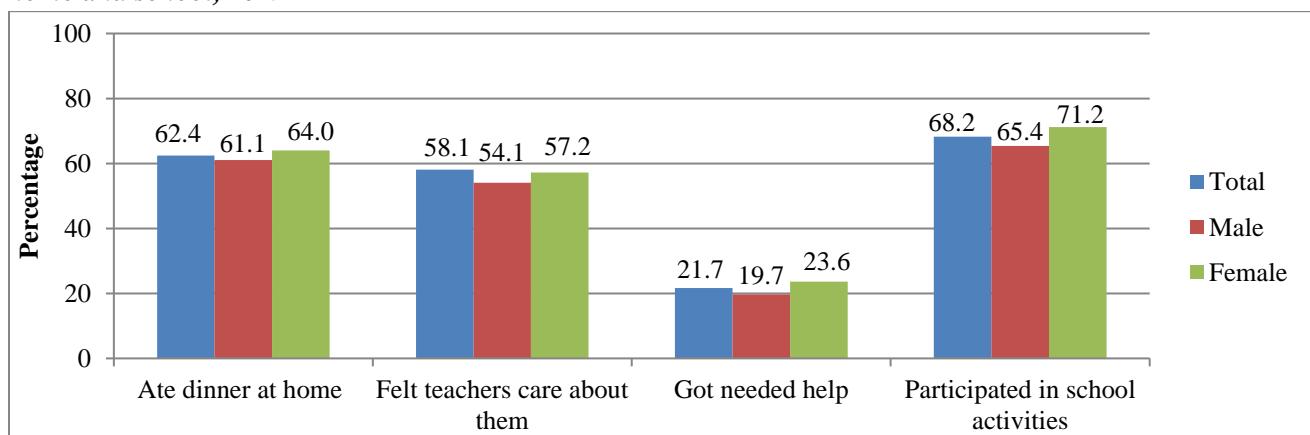
Figure 35: Percentage of high school students by gender who saw a dentist in the past 12 months, had eight or more hours of sleep on an average school night, or used a tanning device 1 or more times in the past 12 months



Support and Involvement at Home and School

In 2019, the majority of high school students ate dinner at home with at least one parent on four or more of the past seven days, agreed or strongly agreed that teachers really cared about them, felt safe at school always or most of the time, and participated in school activities one or more hours per week during an average school week. However, among students who felt sad, empty, hopeless, angry or anxious, only 21.7 percent got help when needed always or most of the time (Figure 36).

Figure 36: Percentage of high school students by gender who have experienced support and involvement at home and school, 2019



Survey methodology

The Missouri Youth Tobacco Survey (YTS) was conducted by the Missouri Department of Health and Senior Services (DHSS) with middle and high school students every odd-numbered spring from 2003 through 2011 and with middle school students only from 2013 through 2017. The Missouri Youth Risk Behavior Survey (YRBS) was administered by the Missouri Department of Elementary and Secondary Education (DESE) with high school students in odd-numbered springs from 1995 through 2011, and then by DHSS from 2013 through 2019.

Both paper and pencil surveys were supported by the CDC, which provided funding for survey administration, and performed school sampling, data tabulation, weighting and primary analysis. DHSS staff administered the surveys by obtaining participation of randomly selected schools, securing class schedules and randomly selecting classes for participation, providing survey materials to participating schools, and collecting and processing completed surveys for shipping to the CDC.

Sampling design

All regular and charter public schools in Missouri containing grades 6-8 in which 6th grade was not the highest grade in the building were included in the sampling frame for middle schools. Buildings containing grades 9-12 were included in the sampling frame for high schools. A two-stage cluster sample design was used to produce a separate representative sample of students for middle school and high school.

In the first-stage sampling, schools were randomly selected with probability proportional to the school enrollment size. In the second stage, systematic equal probability sampling with a random start was used to select classes from each school that participated in the survey. All classes in the selected schools were included in the second-stage sampling frame. All students in the selected classes were eligible to participate in the survey. School and student participation was anonymous and confidential. Passive parental permission was utilized unless the school district required active permission.

Response rates

Response rates were calculated by multiplying the school participation rate by the student participation rate for middle schools and high schools. The response rate must be equal to or greater than 60 percent for data to be weighted to adjust for unequal probability selection of each student and to reduce bias by compensating for differing patterns of non-response.

Sufficient responses for weighting the data have been obtained each year the YTS was conducted in Missouri. In 2017, 33 of 42 (78.6 percent) sampled middle schools participated with 1,813 of 1,957 (91.8 percent) sampled middle school students completing usable questionnaires. The overall response rate was 72.8 percent.

Sufficient responses for weighting the data have been obtained each year the YRBS was conducted in Missouri, except in 2011. In 2019, 30 out of 40 (75 percent) of sampled high schools and 1,216 of 1,425 (85.3 percent) sampled high school students completed usable questionnaires. The overall response rate was 64 percent.